Effect of humidity on electrospun polycaprolactone nanofiber formation using neddleless electrospinning

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ABSTRACT

This paper presents the effect of humidity on electrospun polycaprolactone nanofiber formation using neddleless electrospinning. The nanofiber was made using a NS Lab needleless electrospinning working at the applied voltage of 35 kV. Morphology of the fiber was analyzed using scanning electron microscopy and the fiber size distribution was studied using Fiber Metric. The feed solution was prepared using a polycaprolactone (PCL) in dichloromethane. Fiber diameter of the PCL-dichloromethane system increased from about 100 nm to 145 nm when the humidity increased from 40% to 60%. However, the overall quality of fiber produced at humidity 60% is superior with less large splashes to that produced at 40% humidity. The fiber produced are also much more uniform at 60% humidity. This work may serve as a useful guide to obtain a high quality nanofiber from needleless electrospinning..

KEYWORDS

Nanofiber; humidity; PCL-DCM; fiber size distribution; surface morphology

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